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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,332	11/24/2003	Kazuhisa Takayama	60280 (70904)	6559
21874	7590	08/24/2005	EXAMINER	
EDWARDS & ANGELL, LLP			FALASCO, LOUIS V	
P.O. BOX 55874			ART UNIT	
BOSTON, MA 02205			PAPER NUMBER	
			1773	

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/722,332

Applicant(s)

TAKAYAMA ET AL.

Examiner

Louis Falasco

Art Unit

1773

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 17 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/24/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

PAPERS RECEIVED

The Information Disclosure Statement filed is acknowledged.

The Election filed 6/17/05 is acknowledged.

CLAIMS

The claims are: 1 to 18.

Election/Restriction of Invention

1. Applicant's election of claims 1 - 16 in the reply filed on 6/17/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 17 and 18 are withdrawn from consideration.

The claims under consideration are 1 to 16.

Claim Rejections - 35 U.S.C. §112

Statutory Basis

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 1 to 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim term *absolute value of magnetization* is indefinite as to its meaning in the claims. The term has not been clearly defined in the specification, nor has it been recognized as common term in the art and it is unclear what *absolute value of magnetization* might encompass. There are many diverse magnetic field strengths in the art - e.g., the *absolute value of perpendicular magnet field strength*, or the *absolute value of external magnetic field strength*, or the *absolute value of static magnetic field strength*, or some combination magnetic field strengths such as the *absolute value of* [Hex - Hs], [Hex + Hs], etc. rendering the instant use of *absolute value of magnetization* indefinite.

The claim term *Curie Temperature* appearing on the last line of claim 1 and line 6 of claim 12 is indefinite as to its meaning in the claims. The *Curie Temperature*, the temperature which a magnetic material exhibits ferromagnetism must be specific to a material.

Claim Rejections - 35 U.S.C. §103

Statutory Basis

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 to 16 are rejected under 35 U.S.C. 103(a) as obvious over **Kirino et al** (US 6893746) or **Shimazaki et al** (US 6671233) or **Hirokane et al** (US 6678219) any taken in view of **Shinoda et al** (US 6638597).

Kirino et al, **Shimazaki et al**, or **Hirokane et al** teach the magnetic recording medium of the claims except the inclusion of a *metal* layer as a layer on the substrate having 'unspontaneous' magnetization property. **Kirino et al**, **Shimazaki et al**, and **Hirokane et al** teach a magnetic recording medium comprised of a substrate, a non-magnetic layer, a first magnetic layer with a second magnetic layer formed on top of the first magnetic layer (see **Kirino et al** Fig. 1 items 1, 2- cf materials of col. 25 lns 14 , 15 where the non-magnetic layer is material would have the 'unspontaneous'

magnetization property, not incited to magnetization, and Fig. 1 item 3; in **Shimazaki et al** see col. 5 lns 43-47, Fig. 17 items 1, 3 - *cf* dielectric materials would have 'unspontaneous' magnetization property since they would are not incited to magnetization, 8 and magnetic layers 10 & 28, col. 25 lns 6-13; and in **Hirokane et al** see Figs. 1, 8 10 or 11 - items 1, 2 *cf* materials of col. 5 ln 17 not incited to magnetization and 3).

Kirino et al, **Shimazaki et al** or **Hirokane et al** do not teach a *metal* layer on the substrate as the layer having the 'unspontaneous' magnetization property. However **Shinoda et al**, like the primary references, is directed to magnetic recording medium and teaches the ordinary skilled worker to have a *metal* layer between the backing and magnetic layers (**Shinoda et al** Fig. 1 items 7 and 8) This metal inherently has 'unspontaneous' magnetization property since the metal is identical to what applicants' disclose as the metal having unspontaneous magnetization property (**Shinoda et al** col. 9 lns 37, 38 - *cf* instant specification page 15 last paragraph).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adopt the convention of a *metal* layer having unspontaneous magnetization property on the substrate as taught by **Shinoda et al** for in the magnetic recording medium of the primary references the purpose of better protecting the backing from a laser beam. One skilled in the art would have been motivated to adopt **Shinoda et al** with the expectation of increasing the thermal characteristics of the recording media economically blocking energy passage from the media (col. 7 ln 64).

None **Kirino et al**, **Shimazaki et al**, and **Hirokane et al** explicitly call for the claimed second magnetic layer having a greater largest possible *absolute value of magnetization* than the first magnetic layer within a temperature range from room temperature to Curie temperature, however the recording media of **Kirino et al**, **Shimazaki et al** and **Hirokane et al** would inherently have the second magnetic layer with the greater largest possible absolute value of magnetization than the first magnetic layer from room temperature to its Curie temperature because the magnetization of the **Kirino et al** ferromagnetic film, see layer 4 - corresponding to the instant second layer, is a recording layer. This is taught as an amorphous Co--Cr alloy with a higher maximum magnetism than layer 3, the layer corresponding to the instant claimed first layer as shown in **Kirino et al** at col. 4 lns 21-25, col. 6 lns 36-39, and "Measurement of Saturation Magnetization" at col. 19 lines 36-40. The magnitude of magnetization of the **Shimazaki et al** recording layer 10 of Fig. 16A-C, corresponding to the instant second layer, would have a higher maximum magnetism than the storage layer - as illustrated by Fig. 11 with temperature-dependent change in transfer magnetic field to the adjacent lower magnetic layer 28 having the lower saturation magnetism - see col. 10 ln 58, 59 and the magnetic effects illustrated in Fig. 16A and as taught at col. 12 lns 64-67. The magnitude of magnetization of the **Hirokane et al** ferromagnetic storage layers 4, corresponding to the instant second layer, is the storage layer and would have a higher maximum magnetism compared to layer 3, the layer corresponding to the instant claimed first layer, layer 3 is a only the flux forming layer to induce a magnetic fields

where as layer 4 is a storage layer accumulating magnetic bits. This is demonstrated in Fig. 7, see also col. 10 lns 13-15.

As to claims 4, 5, 15, and 16 rare earth metal and 3d transition metal see **Kirino et al** where the instant first magnetic layer corresponds to layer 3, having rare earth - e.g., *Ho*, *Tb*, etc. and "Formation of Ferromagnetic Film", col. 5 lns 36-38; and col. 4 lns 42-44 or see **Shimazaki et al** col. 5 lns 47-54, col. 25 lns 22-50; or **Hirokane et al** col. 9 lns 20-31, Examples 1 & 5.

As to claims 2 and 13 relative magnetization ratios, and claims 3, 6, and 10 magnetic layer thicknesses, absent evidence to the contrary, relative amounts and thicknesses would have been a matter of routine optimization¹, obvious from the prior art. **Kirino et al** shows that dimensions would be varied by the ordinary skilled worker depending on the field strength required in the apparatus recording/playback with various heads - see col. 7 lns 3-8, col. 8 lns 34-38, col. 17 ln 48, col. 18 ln 11 and Fig. 11 and also variations rare earth metal and 3d transition metal would be a matter of routine selection based on the apparatus the media intended for - Fourth Embodiment "Formation of Ferromagnetic Film"; see also **Shimazaki et al** col. 15 lns 21-23, col. 24 lns 10-13, and **Hirokane et al** thickness variations col. 14 lns 53-57 and materials col. 6 lns 46-55.

¹ "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)

As to claims 7 to 9 requiring a grained surface see **Kirino et al** col. 11 lns 11, 12 also this is the degree of roughness as evident from the instant disclosure page 28 lns 9-11 and some roughness would have been expected in **Ro** since **Ro** shows the metal as pressed onto a polymer substrate of controlled roughness (see **Ro** Example 1 formation of grooves and pits *paragraph* [0042]). The specific degree would have been a matter of routine optimization or choice absent evident to the contrary², or dependent on the degree of bonding pressure.

As to claim 11 the intended use has not given weight, see *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963), and the structural limitations standing alone, see *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

OTHER REFERENCES

Shinoda et al (US 638597) is cited as being of interest, being cumulative to **Ro** teaching a *metal* layer on the substrate inherently having 'unspontaneous' magnetization property (see **Shinoda et al** layers 7 on layer 8).

² "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)

Saga et al (US 2003/0123333) is cited as being of interest, being cumulative to **Ro** teaching a *metal* layer on the substrate, inherently having 'unspontaneous' magnetization property with a measured adjustment of surface roughness (see **Saga et al** paragraph [0067]).

Chen (US 2004/0103422) is cited as being of interest, also cumulative to **Ro** teaching a *metal* layer on the substrate, inherently having 'unspontaneous' magnetization property with a measured adjustment of surface roughness (Fig. 2b).

Fullerton et al (US 2004/0071923) is cited as being of interest, being cumulative to **Kirino et al**, **Shimazaki et al**, or **Hirokane et al** – showing laser assisted recording media, though lacking the Rare Earth metal in the Transition metal layers.

SUMMARY

The claims are 1 to 18.

- Restriction has been required. Claims 17 and 18 have been withdrawn from consideration. The claims under consideration are: 1-16.
- No claim has been allowed.
- Information Disclosure Statement has been received and considered.

INQUIRES

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Louis Falasco, PhD whose telephone number is (571)272-1507. The examiner can normally be reached on M-F 10:30 - 7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol D. Chaney, PhD can be reached at (571)272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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08/05


CAROL CHANEY
SUPERVISORY PATENT EXAMINER